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FACILITIES AND ENVIRONMENTAL EFFECTS
SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
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WELDING
INDUSTRIAL ENGINEERING
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 AND
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**PLANNING AND SHIP OUTFITTING PRODUCTION CONTROL
AT NEWPORT NEWS**

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PLANNING AND SHIP OUTFITTING
PRODUCTION CONTROL AT NEWPORT NEWS

I. INTRODUCTION

This report provides a general overview of the techniques used in developing the Product Plan at Newport News, and covers in more detail the implementation and control of the plan, with emphasis on ship outfitting.

The intent is to inform interested parties about the Outfit, Planning, and Control Methods used at Newport News. However, at this writing we are making extensive improvements to our material and production control systems. These improvements in time will alter some of the methods used in Outfit Planning and Control; and it is felt that these improvements may be of interest.

1.1 Material and Production Control Improvement(s)

The development and implementation of these improvements is complex, and involves almost all of the operating divisions. A committee has been established to coordinate and steer improvements. The committee is called "IMPCO Committee," and draws its name from improved material and production control. The tasks either completed or in-process by the IMPCO Committee are:

- . Develop Synchronized Schedules
- . Standardization of Key Company Numbers
- . Converting **to** and Cataloging Part Numbers
- . Simplify and Improve Accuracy of Material Selection
- . Improve Material Requirements Planning
- . Improve Record Accuracy
- . Simplify Shop/Ship Material Requisitioning
- . Improve Shop Planning, Control, and Performance Measurement
- . Develop a Product Structure for Outfitting Similar to Structural

This list is not inclusive of all the on-going improvements but only cites the major tasks.

2. DEVELOPING THE PRODUCT PLAN

Although our approach to developing a product plan is basic, and probably does not differ from techniques used by other shipbuilders, it is subject to change due to the aforementioned IMPCO Projects.

In developing a product plan there are three segments of the plan; 1) Structural, 2) Outfitting and 3) Manufacturing. As stated earlier, this report is slanted toward the outfitting segment of the plan. However, you cannot explain the outfitting plan without briefly covering the other two segments.

2.1 Planning and Scheduling

Planning and scheduling begin during the proposal evaluation before award of a contract. Availability of facilities, manpower, and long lead time materials are reviewed. Working from the proposed delivery date, established by the "Invitation to Bid," tentative award, keel, launch, and delivery dates are determined. The ship's size, its type and the company's past performance on similar ships are considered.

There are six basic documents or schedules that are paramount to the development of the product plan. Each document is an integral part of the plan and in most instances each is dependent on the other in terms of its development. These six documents are:

- . Structural Erection Diagram (SED)
- . Space Control Diagram (SCD)
- . Ships Group Index and Schedule (SGIS)
- . Ships Drawing Schedule (SDS)
- . Material Ordering Schedule (MOS)
- . Manufacturing Group Index and Schedule (MGIS)

Group Definition - A group is a definite quantity of material to be installed or manufactured as a unit or units. The quantity of material included in a group is intended to be such as to allow maximum efficiency in handling, storing and installation, with minimum interference to adjacent work.

The following is a brief explanation of these documents:

2.2 Structural Erection Diagram (SED) (See enclosure (1))

The Structural Erection Diagram is a drawing of the inboard profile of the ship with one or more cross sectional views and shows the sequence in which the ship will be erected.

the last two indicating the planned sequence of unit erection within the section, 'for example

2008
└─ Indicates Unit Erection Sequence
└─ Indicates Section Number

Also shown on the Structural Erection Diagram is a breakdown of the major events for each structural section, such as:

Drawings and Groups Complete
 . Material Available
 . Molds Complete
 . Fabrication Complete,
 . Sub-Assembly Complete,
 . Erect on shipway

2.3 Spaces Control Diagram (SCD) (See enclosure (2))

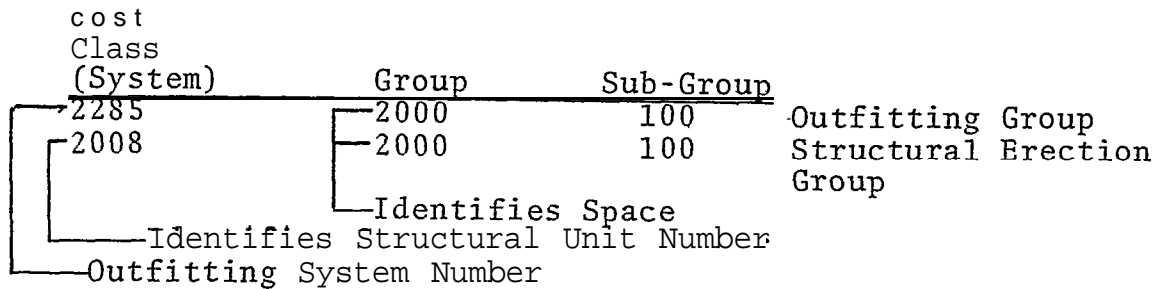
The Space Control Diagram is developed for use in control of outfitting and aids in the development of the "Ships Group Index ,and Schedule" (see 2.4). This diagram divides the ship into space control divisions, each of which is identified by a space control number. Normally the rule for defining space control divisions is one deck level extending the width of the ship bounded fore and aft by main'transverse.bulkheads.

Unlike the Structural Erection Diagram the space control divisions are not numbered in sequence of erection, but are structured for the control of outfitting groups assigned to a given space.

2.4 **Ships** Group Index and Schedule (SGIS) (See enclosure (3))

The SGIS, is the system that schedules the completion of outfitting groups both in the shops and on the ship. Using the "Erect on Shipway" date for structural sections; established in the Structural Erection Diagram, as the scheduling date for start of outfitting, the Ships Group Index and Schedule is prepared. The nature of the SGIS is structure, system, and space oriented. Each group number is either combination of a structural erection units number and space control number, or a

combination of an outfitting cost class number (system) and the space control number; for example



Schedule dates are applied to these groups by establishing an installation start date (based upon the Structural Erection complete date on the Structural Erection Diagram) and working back through the following scheduled events (from latest to earliest);

- . Installation Start
- . Electrical Shop Complete
- . Pipe Shop Complete
- . Sheet Metal Shop Complete
- . Machine Shops Complete
- . Foundry Complete
- . Material Available
- . Groups and Drawing Issued
- . Drawings Complete

Once developed the SGIS provides the scheduling framework for all other derivative schedules; Ships Drawing Schedule, Material Ordering Schedule, Manufacturing Group Index and Schedule, etc.

2.5 Ships Drawing Schedule (SDS) (See enclosure (4))

The Ships Drawing System (SDS) schedules the required drawings through the different design sections, and the applicable owner, for approval in time to meet the drawing need of the SGIS.

Design develops the SDS using the "Drawing Complete Date" established in the Ships Group Index and Schedule. Although some drawings may cover more than one group, the drawing is scheduled for completion to suit the earliest group shown in the SGIS. The SDS is inclusive of all the drawings required to construct the product, e.g. Structural, Piping, Electrical, Machinery, Ventilation, and Manufacturing drawings.

2.6 Material Ordering Schedules (MOS) (See enclosure (5))

The Material Ordering Schedule is the document that

schedules the in-yads date of the required purchased material to suit the Ships Group Index and Schedule.

The MOS is developed by Design in a manner similar to that used for the preparation of the Ships Drawing Schedule. Using- the SGIS, "Contract Guidance Plans" and historical data, estimates are made of the gross material- requirements to be ordered from vendors.

These estimates are scheduled according to need and are further refined and the schedule updated as the drawings are developed.

2.7 Manufacturing Group Index and Schedules (MGIS) (See enclosure (6))

A manufacturing group is in effect a purchase order **to** ourselves requiring the manufacture of an item(s) to support the timely construction of the ship.

The Manufacturing Group 'Index and Schedule is developed by the applicable Design divisions and the construction projects. It schedules the manufacturing groups through the various shops to suit the material requirements of the Ships Group Index and Schedule.

3. IMPLEMENTING THE PLAN

The Ships Group Index and Schedule, Ships Drawing Schedule, Material Ordering Schedule and the Manufacturing Group Index and Schedule-provide the major building blocks for the Product Plan. These schedules are computerized and along with other computer systems (to be explained later) provide management with the tools to implement and control the Product Plan. The Plan is implemented as these' schedules and the applicable drawings are issued to Production Engineering and the construction trades.

3.1 Production Engineering (Outfitting)

Production Engineering is responsible for producing:

.Group Sheets (Material List)
.Shop Work Packages'

to suit the Ships Group Index and Schedule and the Manufacturing : Group Index and Schedule by using the drawings- issued by Design: Upon review of the drawings and schedules it may be determined that a group has not been provided in the schedule(s) or a group in the schedule(s)is not required. When this is determined appropriate action is taken to revise the schedules (MGIS or' SGIS).

3.2 Group Sheet Preparation

A Group Sheet is a listing of the required material keyed to a specific group (system and space) on the ship. The list authorizes work and provides quantities, description, sources, and routing of the material.

At present there are two methods of physically preparing group sheets; one is the conventional manual method and the other is a computer assisted method, referred to as AGS (Automated Grouping System). The AGS system closely audits all data and produces a more legible, standardized computer printed group sheet (See enclosure (7)).

It also interfaces with the "Inventory Management System" (IMS) to aid in the Material Requirements Planning (MRP). Also group sheets are structured to aid in the preparation of material requisitions.

3.3 Pipe Detail Grouping Section

The Pipe Detail Grouping section is responsible for specifying the boundaries for Pipe Shop Assemblies (called details), Which will be input to the CAPDAMS system (see section 3.4). This section also groups non-CAPDAMS material and prepares the preliminary piping arrangement drawing for use by the CAPDAMS section.

3.4 CAPDAMS Drawing Preparation Section (see enclosures (9) and (10))

CAPDAMS is the acronym for Computer Aided Piping Design and Manufacturing System which permits data entry and audit of pipe detail material and geometry data.

Using the prepared Preliminary Piping Arrangement Drawings, data is extracted and input to the CAPDAMS system. The system provides centerline check prints, individual Piping Detail Drawings and printed manufacturing instructions. In addition material requirements summed to the pipe detail level interface with the IMS system to aid MRP. The CAPDAMS output is issued to the Shop Work Package Planning Section.

3.5 Shop Work Package Planning Section

Upon receipt of group sheets and drawings, the Planning Section prepares and schedules work packages for the various shop(s) - Machine Shops, Steel Fabrication, Sheet Metal, Electrical and Pipe Shops, in accordance

with the SGIS or MGIS. A work package consists of a brief description of the item(s) to be made, the source for the required material, a schedule for completion, the target hours required to complete the work and the material requisitions.

The work package information is input to the "Production Scheduling Control System (PSC)" (see section 4), and in the case of Pipe Shop Planning, input is made to the Pipe Package Ordering System which draws the material requirements from the CAPDAMS system by pipe detail and interfaces with the IMS system to check the availability and location of the material and, in addition; generates material requisitions and packing lists for the Material Support Division (see enclosure (8)).

4. CONTROLLING THE PRODUCT PLAN

The Ships Group Index and Schedule, being the ship schedule that all derivative schedules must support, provides adequate management controls at the group level. However, because of the number of items subordinate to the group requiring manufacturing, the system does not provide sufficient information required to most effectively manage a manufacturing shop.

A computerized shop scheduling and control system is used to provide feedback to the Ships Group Index and Schedule and provides the shops a tool to measure the day to day production performance. This system is known as the "Production Scheduling and Control System" (PSC).

4.1 Production Scheduling and Control System (PSC)

PSC provides

- On-Line Detailed Work Status
- Daily/Weekly Work Sequence Lists
- Target Hours for Foremen
- Work Performance
 - Completed versus Delinquent Work
 - Actual versus Target Labor
- Data for:
 - Make or Buy Decisions
 - Capacity Planning
- Schedule for Material Requisitioning

Requirements:

- Work Breakdown According to Predefined Work Centers
- Realistic Schedule Dates
- Realistic Target Hours
- Accurate Feedback

The PSC system used in our Shops provides the framework for a total yard work management system.

4.2 Yard Production Scheduling and Control

Our objective is to have a total mechanized yard production scheduling and control system, capable of providing many levels of management information. Our progress to date includes the linking of the individual shop PSC systems to the SGIS thereby creating the basis for such a system. As a result, we can make inquiries by a given contract and group number, and the system will access the applicable shop PSC data bases to determine detailed production status (see enclosures (11) through (14)).

CONCLUSION:

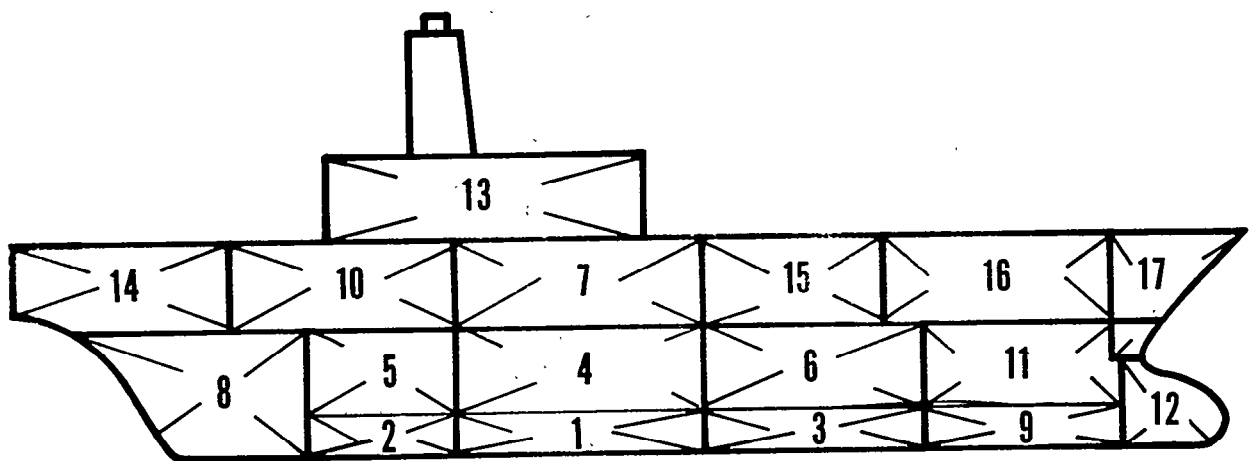
This report has provided a brief overview of the techniques and systems used at Newport News in developing, implementing, and controlling the Product Plan, and was prepared in the spirit that the information may be of interest to other concerns.

ACKNOWLEDGEMENT:

This author wishes to thank Mr. D. F. Carneal and Mr. E. C. Kizer of the Newport News Shipbuilding and Dry Dock Company for their assistance in the preparation of the data for this report.

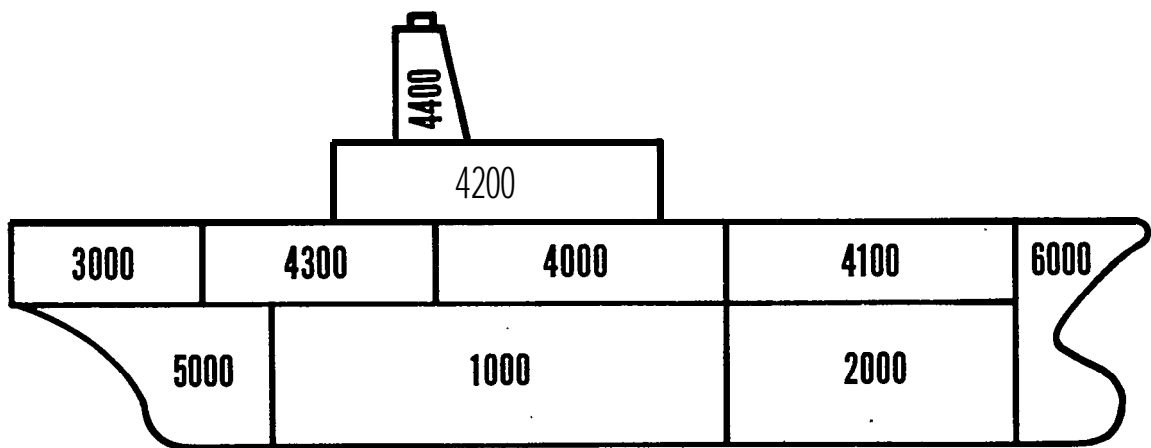
REFERENCES:

- (a) Report of Task Group for Improved Production Scheduling and Control," chaired by Mr. C. C. Coon, dated June 29, 1979.
- (b) "An Introduction to Grouping," Machinery Design Department, Newport News Shipbuilding and Dry Dock Company.
- (c) "Production Control System," Newport News Shipbuilding and Dry Dock Company.



STRUCTURAL ERECTION DIAGRAM

Enclosure (1)



SPACE CONTROL DIAGRAM

Enclosure (2)

Enclosure (3)

SHIP'S GROUP INDEX & SCHEDULE

MATERIAL CONTROL - GROUP INDEX AND SCHEDULE - OUTFITTING JOB T006CJ-10 TOTAL

CLASS 1400P-10. SUBGRP. 15SEP.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Enclosure (4)

SHIP'S DRAWING SCHEDULE

DRAWING SCHEDULE
N 54-1 (REV. J)

DRAWING SCHEDULE N 58-1 (REV.) J			DEPARTMENT PLAN LIST			JOB TO 15CF			061AD			JUN 26 1978			77									
N. N. DRAWING NO. (03)		DT WV GE REV AC PT (45) (55)	SUPV. (08)		TITLE (11)	FOR SPECIAL JOB ORDERS ----->		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	CODED NC (44)
BUSHIP/M.A. DRAWING NO. (06)			DEPT (09)			INFO DWG (69)	ETD & HTD TECH REVIEW		APD TECH REVIEW		WEIGHT INFO		TO DEPT HEAD (14)	TO OWNER (18)	TO GROUP (23)	TO RT (29)	YARD ISSUE (33)	NOTES (40)						
REF. DRAWING NO. (07)			HULL SECT (10)		GROUP NUMBERS (01)		IN (12)	OUT (13)	IN (73)	OUT (78)	IN (82)	OUT (86)	AHS L 											

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MATERIAL ORDERING SCHEDULE

DIV M HULL NO. 0616D DIVISION ORDERING SCHEDULE - P.O. SEQUENCE L-PAGE NO. 95

PUR ORDER NO.	GROUP	MFG PA	ORD USE	TEST CODE	QTY	NNCOST	IDENT - NO.			
PREL	FINAL	DRFT	PREL	TECH	P--D	FINAL	P.O.			
SPECS	SPECS	TYPING	PA	REVW	D--P	PA	PLN			
				P.O. ORD ORD USE USE						
				TYPE DPT SUP DPT SUP						
				PLNS PLNS WORK PLNS RECD						
				YARD						
				ITEM DESCRIPTION						
				SERVICE APPLICATION DESCRIPTION						
				SPECIFICATIONS PSEUDO IDENT NO.						
616D	2302P	1	2300	1000	700	060 010 012	1G P DEK P DEK C MATL ND	10301	11036000	
						070 071 081	093 093			
						10046 10116 12206	03147 03207	SERVO VALVES	531 PO 2300-68	
						05065 12105 12136	07316 07276	FOR HYD SYS		
								N.N. DWG 215594		
616D	2100V	2	M255626	1	020		SA V C66 M EH3	00003	13058000	
						101		103	GAGEBOARD ASSEMBLY	
						05097		03207	10107	
02017	05097							01040	FOR HYDRAULIC STORAGE TANK	EL GR 2300-1000-
									2300	
616D	2300K	2	2300	1403	300	044 019	1A K CBS P DEK A MATL RT ND	00301	11032000	
						053 062	082	126	ACCUMULATOR	
						07106 00203	02163 12375	12373	FOR S/S SED FLOOD CONT & EXT HYD SYS	
						11016 04203	12146 03107	03107		
616D	2000T	8	2300	4100	100	024 008 006	1H T JDS P DEK A MATL	ALVA 10301	11034000	
						058 071 072 010	086 033 092 023 106 109 133 1132	HAND PIPES	580 PO 2300-1	
						05106 10116 10125 12135	01247 02077 03077 04167 05137 07047 12197 12197	FOR HYD SYS		
						10036 11196	12025 01127 04042 04042 11072 01127		MIL-P-5515	
616D	2300K	9	2200	11033335	060 007		1J K CBS P DEK A MATL ND	AXMA 00301	11035000	
						010 043	044 051	1111	CHECK VALVES	
						03036 03296	04056 05246	07056 05207 05246	FOR HYD SYS	
						02105 05203	01126 03106	03287 03106	NN DWG 230-1689	
616D	2300P	10	2300	1400	300	046 012 012	1H P DEK P DEK C MATL	ALVU 00301	11039000	
						056 057 059	081 003 037 093 101 104 150 150	DEHYDRATION UNIT	WATER REMOVAL	
						08203 07053 03276	12206 01047 01317 03147 05007 05307 04173 04173	FOR SS & STEER & STERN DIV SYS		
						12015 12123 01037	01207 03217 04173 05177 05173 01030			
						029 050 042	054 053	055	126 VALVE BYPASS & UNLOADING	
						12225 12253 05226	06143 06236	06283	10317 FOR HPP SS & STEER & STERN DIV SYS	
						11105 11173 06256	06286 11126 11196	11196	N.N. DWG 215525	
616D	2300K	10	2300	1400	400	040 011	1A K CBS P DEK A-MATL RT	AXMA 0030D	11173000	
						092 095	036 107	107	ACCUMULATOR HYDRAULIC FLOATING PISTON TYPE	
						03077 03287	04047 05267	05207	03273 FOR STERN DIVING EMERGENCY STORED ENERGY SYSTEM	
						11245 03116	06136 03135	03163	AS APPROVED	

Enclosure (6)

MANUFACTURING GROUP INDEX & SCHEDULE

MATER. CONTROL - GROUP INDEX AND SCHEDULE - OUTFITTING JOB T006CJ-10 TOTAL

CLASS GROUP				P C L T	DESCRIPTION	D C	PREL DWG	DWG & LIST ISSUED	"A" MATL RECD	"C" MATL RECD	X 10 COMPL	FO COMPL	MSS COMPL	OA COMPL	PIPE SHOPS COMPL	EL SHOPS COMPL	EREC START	EREC COMPL																																																					
CLASS	GROUP	PROJECT	DATE																																																																				
2300	1429	1		01 04	MANF GAGE BOARDS	05 08	130 134 135	12 13	14 15	16 17	18 19	20 21	22 23	24 25	26 27	28 29	30 31	32 33																																																					
				02		06	P112871226701028	24 25	26 27	28 29	30 31	32 33	34 35	36 37	38 39	40 41	42 43	44 45																																																					
				03		07	0503705037																																																																
2300	2414	1		01 04	MANF FDN & RESILIENT MOUNTS	05 08	086 090 091	12 13	14 15	16 17	18 19	20 21	22 23	24 25	26 27	28 29	30 31	32 33																																																					
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				03		07	0124712077																																																																
2300	2424	1		01 04	HAND PUMP MANIFOLD STATION/VARIOUS S S ELCR	05 08	122 126 127	12 13	14 15	16 17	18 19	20 21	22 23	24 25	26 27	28 29	30 31	32 33																																																					
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QUANTITY																																																																							
ISSUED				04 26 78																		TOTAL NO. OF COPIES FOR DISTRIBUTION										NULL NO. M 616										OUTFITTING SHEET NO. 2300										2										4									

Enclosure (7)

Figure F.2

006530

PROJECT LINE*TS*DRAWING AND ITEM NO.
STRUCTURE MF*SC*SOURCE(MATERIAL IDENT NO.)

GROUP LIST---MACHINERY OUTFITTING GROUP
QUANTITIES LISTED FOR 1 SHIP(S)
*QTY UM*DESCRIPTION
TOT YTL UM MCLV SSDR*SPECIFICATIONS OR NOTES

DATE 09/22/77

* MATERIAL*ROUTING
* *CHG*

2	L81	6002-95#31	* 4PC COVER-MBT VENT VALVE 4 A&B & 5 A&B	*ALUMINUM X10-MS
	MF PD	6100-4059-H206#2	* 195.00051	
2	A9	L82	6002-95#33	* 4PC GASKET-13 UD X 10.125 ID X .125 THK
	MF PY	9779591	* 196.00051	*BUNA-N MS
2	L83	6002-95#34	* 4PC SET SCREW #10-24 X .375 LG FL PT	*NI-CU ST-MS
	PN	9752805		
2	L84	6002-95#40	* 40PC SCREW-SCH CAP .500 X 1.125 LG SELF LOCKING	*NI-CU ST-MS
	PN	9782929		
2	L85	6002-95#41	* 32PC SET SCREW .500 X .500 LG	*TEFLON SM-MS
	MF PN	9756424	* 24.0001M	
2	L86	6002-95#42	* 4PC PIPE PLUG .500 RAISED SQ HD	*CARBON STEEL
	PN	9714170		* ST-MS
2	L87	6002-98#51	* 4PC SPRING RETAINER MF 4.500 DIA BAR	*NI-AL-BRZ SM-MS
	MF PN	9737051	* 24.0001M	
2	L88	6002-98#52	* 4PC SPRING	*BE-CU ST-MS
	PN	5901212		
2	L89	6002-98#53	* 2PC GROOVED BUSHING MF 4.500 DIA BAR	*NI-AL-BRZ SM-MS
	MF PY	9737051	* 13.0001M	
2	L90	6002-98#54	* 2PC PLAIN BUSHING MF 4.500 DIA BAR	*NI-AL-BRZ SM-MS
	MF PN	9737051	* 13.0001M	

QAG 1-A 1-C X10 MLD FD QA HSS FAB PF EL SA GH PH E-S GRPSTA TRADE ISSD IYGP*CMIRACT *CHARGE *GRJUP TRANS-ITL
 COM 081 MG *6160-7-8-9-0*6002 *6002-3000-100-0
 5032-3000-100-0 HBT 4 & 5 VENT VALVES & INTER COMN AFT BY FIELDS J E EX! 884460 * SHEET 50
 SOS
 30 P4 FJ BL IM MS RM HSS PY PF PS GH PC QA JB EL RD WH MG EG PG MH AH X10 ML APD RJ VI ST 330 PTU Ld SNO APR LINE ITEMS
 1TU107

Enclosure (8)

MATERIAL REQUEST

REQUEST NO 99442PRO		MATERIAL DESTINATION 100		RECIPIENT'S NAME NA		CONTROL LEVEL STD		IF ALL MATERIAL IS NOT AVAILABLE <input checked="" type="checkbox"/> FILL WHAT IS AVAILABLE AND SHIP BAL. LATER <input type="checkbox"/> FILL WHAT IS AVAILABLE AND CANCEL BALANCE <input type="checkbox"/>	
DATE ORDERED		REQUESTER'S SIGNATURE TILMAN		DEPT 061		PHONE 80-5216		REQUESTER'S SOC SEC NO 231-70-0938	
DATE RECEIVED BY WAREHOUSE		CHARGE TO 618		ACCT HULL 618		JOB ORD D		SUB DIV 2355	
				AUTHORIZED FOR (Group Only)		HULL 618		P L D	
						COST CLASS 2355		GROUP 1000	
								SUB GROUP 400	
								S.S. GRP	
QUANTITY WANTED 1.000		U M PC		MATERIAL IDENTIFICATION NUMBER 9717086		DESCRIPTION CPLNG 1.250 X 1.000 BRZ REDUCIN FE		PIECE NO	
ISSUE PC	LOC. 40959	2 31D6G11	3 31P124	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
QUANTITY WANTED 1.000		U M PC		MATERIAL IDENTIFICATION NUMBER 9713458		DESCRIPTION FLANGE 1.000-150 LB BRZ SILVER BRA		PIECE NO	
ISSUE PC	LOC. 31E5C26	2	3	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
QUANTITY WANTED 4.000		U M FT		MATERIAL IDENTIFICATION NUMBER 9821032		DESCRIPTION TUBING 1.660 NOM OD X 0.065 MIN CU		PIECE NO	
ISSUE FT	LOC. 23RAC188	2 23RAC293	3 23RACK79	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
QUANTITY WANTED 1.000		U M FT		MATERIAL IDENTIFICATION NUMBER 9821028		DESCRIPTION TUBING 1.315 NOM OD X 0.065 MIN CU		PIECE NO	
ISSUE FT	LOC. 23RAC333	2 23RAC161	3 23CARD	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
QUANTITY WANTED		U M		MATERIAL IDENTIFICATION NUMBER		DESCRIPTION		PIECE NO	
ISSUE U/M	LOC.	2	3	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
QUANTITY WANTED		U M		MATERIAL IDENTIFICATION NUMBER		DESCRIPTION		PIECE NO	
ISSUE U/M	LOC.	2	3	4	5	6	TRACE CODE	SHEET	LINE
ISS. QTY.							DRAWING	SHEET	REV. ITEM
LINE	DEPT.	ESTAB. BY	DATE	C.P.	REL. BY	DATE	JOB NUMBER 618C02559	PACKAGE	STAGING LOCATION
033	COMMENT 99163207	EDD						Sheet of MO. DAY YR	REQUEST NO 99642PRO

ORIGINAL

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

Use SAFETY SENSE Every Day

244

193102
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PIPE DETAIL MANUFACTURING RECORD

BEND PIPE IN STEEL SHOP - MACH. 4																																																																																		
NOMINAL SIZE 5.00 THICKNESS 0.220																																																																																		
BEND		DIST		BEND		CLOCKWISE		BEND		COORDINATES (TEMP NOT INCLUDED)																																																																								
PTS	NOS.	C.B.C.	1 TANG	O.B.T.	RAD	ROTATION	ANGLE	END PREP	TEMP	CUT	X	Y	Z																																																																					
1											42.170	6.000	0.																																																																					
2	1	14.11	12.00	12.00	3.00	0.	16.0		3.00	6.85	37.920	6.250	0.																																																																					
3	2	28.61	29.03	24.85	3.00	180.8	12.6				10.000	0.	0.																																																																					
N		13.66	15.30	12.00				PN-1B	0.	7.53	3.875	0.	0.																																																																					
DISTANCE FROM POINT 1 TO CENTER OF FIRST BEND										4.26																																																																								
DISTANCE FROM CENTER OF LAST BEND TO POINT N										6.13																																																																								
GROUP 2285-4200-5502-																																																																																		
ORDER # 042182																																																																																		
<table border="1"> <thead> <tr> <th>H</th> <th>DEPT</th> <th>STOP</th> <th>NAME</th> <th>DATE</th> <th>CHARGE</th> </tr> </thead> <tbody> <tr> <td>U 6 6 6 6 6</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>L 1 1 1 1 2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>L 6 7 8-9 0</td> <td>MIC</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>															H	DEPT	STOP	NAME	DATE	CHARGE	U 6 6 6 6 6						L 1 1 1 1 2						L 6 7 8-9 0	MIC																																																
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<p>NOTES</p> <p>CLEANING=NN PROC=M83</p> <p>WELD INDEX TABULATION DWG 2285-810</p> <p>THIS DETAIL REQUIRES STAVE DAMPENING</p> <p>THIS DETAIL IS PART OF ARRANGEMENT SUB-ASSEMBLY 4200-2</p> <p>ALLOWANCE ON END OF PIPE AS INDICATED IS FOR TEMPL ABOARD SHIP</p> <p>+ INDICATES NON-DEVIATIONAL MATERIAL, NO SUBSTITUTIONS ALLOWED</p> <p>CONFIGURATION IS NON-DEVIATIONAL, NO VARIATIONS ALLOWED</p> <p>WELDING = NN DWG 0600-26, CL P1</p> <p>BENDING AND FORMING = NN PROCEDURE M84</p>																																																																																		
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INSP																																																																																		
<p>CAPDAMS ISSUED BY: HULL APPL. GROUP NO. 2285-4200-5502-</p> <p>05/04/79 MACH DES 616-617-618-619-620</p> <p>TAG P171-1</p> <p>DETAIL A PAGE 1 OF 2</p> <p>ARRG DWG. 2285-808X1</p> <p>DETAIL DWG. A2285-318 REV. B</p>																																																																																		

CAPDAMS - COMPLIT

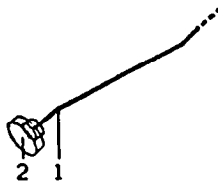
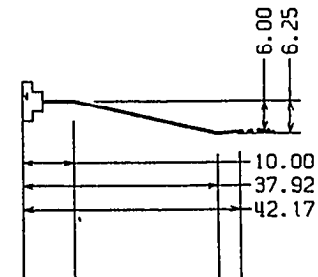
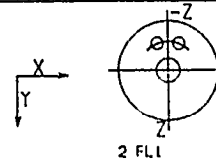
ID PIECE NO
1 P171-1
2 FL1

LOCATION
MAIN PIECE
A ENON

ORIENT
25-Z

JT TY JOINT NO.
PN-18 TD-20542

NDT
RT



DATE-
SIGNATURE-
LOCATION-

P171-1

DETAIL	A	PAGE	2	OF	2
ARR. DWG. NO.	2285- 80841				
DET. DWG. NO.	A2285 -318				

CAPDAMS HULL APPL. GROUP NO.
05/04/79 616 617 618 619 620 2285- 4200-5502-

Enclosure (11)

PSC - GROUP INQUIRY

HULL	P/L	CLASS	GROUP	SUBGRP	SSGRP	CD	ECD	DC
617	D	2300	4102	5408	1	PS	P	

DESIGN	GRPNG	A-MAT	C-MAT	X10	FO	MSS	DA	PIPE	EL	ES	EC
132	136	140						155		156	159
11138	12118	04239						08069		08139	09039
02028	06128	01129						X42A			

CHEKPOINT? ALL
DO YOU WANT MATERIAL DUE STATUS? Y
x42 DIV

JOB NO=617C003401 DWG= ASSEMBLY M41-9 WAIT MATERIAL RESP DEPT=X42
CODE S

JOB NO=617C003402 DWG=A2300-732 COMPLETE RESP DEPT=X42
ASSEMBLY S41-9
DET A

JOB NO=617C003403 DWO=A2300-732 COMPLETE RESP DEPT=X42
ASSEMBLY S41-9
DET C

JOB NO=617C003404 DWC=A2300-732 COMPLETE RESP DEPT=X42
ASSEMBLY S41-9
DET D

JOB NO=617C003405 DWG=A2300-732 COMPLETE RESP DEPT=X42
ASSEMBLY S41-9
DET F

Enclosure (12)

PSC - JOB STATUS BY WORK CENTER

JOB
AREA? PS
ARE YOU ON A HARD COPY TERMINAL? Y
WHICH WORK CENTER? 42C-MD40
START DATE? (MMDDYY) 031279
END DATE? (MMDDYY) 062879

DOCUMENT	WORK ORDER	OP	\$	START	NORMAL	ACCUM	STATUS	PRIOR
618 D6200 7000 100	618C016013	005	052179	.0	.0	LATE	.0	
618 D6200 7000 100	618C016012	005	052179	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005639	005	062579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005637	005	062579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005636	005	062579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005634	005	052579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005632	005	062579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005631	005	062579	.0	.0	LATE	.0	
617 D2300 4203 5530	617C005629	005	062579	.0	.0	LATE	.0	
618 D6200 7000 100	618C016031	005	052179	.0	.0	LATE	.0	
618 D6200 7000 100	618C016030	005	052179	.0	.0	LATE	.0	
618 D6200 7000 100	618C016029	005	052179	.0	.0	LATE	.0	
618 D6200 7000 100	618_C016028	005	052179	.0	.0	LATE	.0	

Enclosure (13)

PSC - WORK CENTER INFORMATION

*CTR
AREA? PS
ARE YOU ON A HARD COPY TERMINAL? Y
WHICH WORK CENTER? 43C-MO40

WORK CENTER=42C-MO40 TEXT=MATL ORDERED
MACHINES= 0 MEN= 0 MOVE TIME= 0 OTIME= 0 DAY LEN= 8 OVRHD RATE= 0
MACHINE RATE= .00 LOAD CODE=1 LOAD PERCENT=085 BASIC CAPACITY= 8
WORK CTR SETUP LOSS= 0 WORK CTR LOSS FACTOR= .00 SU/PROC RATIO= 0

Enclosure (14)

PSC - ORDER STATUS DATA

*STA
AREA? PS
ARE YOU ON A HARD COPY TERMINAL? Y
*TYPE G
CONTRACT OR JO 617
PRODUCT LETTER D
COST CLASS 2300
GROUP 4102
SUBGROUP 5408
SUBSUB

ORDER=617C003401 DESC- L000002 M41-9 RESP-42 DEL, WORKING
ORDER=617C003402 DESC- L000000 S41-9 RESP-42 COMPLETED
ORDER=617C003403 DESC- L000000 S41-9 RESP-42 COMPLETED
ORDER=617C003404 DESC- L000000 S41-9 RESP-42 COMPLETED
ORDER=617C003405 DESC- L000000 S41-9 RESP-42 COMPLETED

WHICH WORK ORDER? 617C003401

WORK	START	NORMAL	ACCUM	COMP	CONTROL
OP0 CENTER	DATE	HOURS	HOURS	LOCATION	TICKET #
005 42C-MD40	080679	.0	0.0	* 070279	150-31254-14213
010 42C-MR40	083079	.0	0.0	* 070279	150-31255-14210
022 42C-4022	090379	.0	0.0	*	150-31256-14217
032 42C-4032	091079	.0	0.0	*	150-31257-14214
037 42C-4037	091779	.0	0.0	*	150-31258-14211
070 42C-4070	100179	.0	0.0	*	150-31259-14218
080 42C-4080	101579	.0	0.0	*	150-31260-14214
085 42C-4085	102279	.0	0.0	*	150-31261-14211
999 42C-CL40	102279	.0	0.0	*	617-03401-14218

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